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(54) Device for massaging extremities, such as legs

(57) A device for massaging extremities of the body, such as legs, and for activating fluid flows, said device consisting of consecutive annular, mutually connected elastic jacket bags (2—15) disposed to encircle the leg (1) and in which pressures can be produced with the aid of a pressure source (P) and a fluid, which cause a massaging effect. The intervening space (16) defined between the jacket bags (2—15) and the leg 15 also connected to the pressure source (P) and can therefore be pressurized, whereby the jacket bags (2—15) are with the aid of the pressure in the intervening space (16) simultaneously depletable of pressure and further, after the jacket bags (2—15) have been pressurized, the intervening space (16) is with the aid of the pressure in the jacket bags depletable of pressure. The drawback encumbering known devices of this type, i.e. control of the pressure by means of very complicated valve systems, is therefore avoided.



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SPECIFICATION

Device for massaging extremities, such as legs

The present invention concerns a device for massaging extremities of the body, such as legs, and for activating fluid flows, said device consisting of consecutive annular elastic jacket bags disposed to encircle the leg and connected to each other, and in which pressures developing a massaging effect can be produced by the aid of a pressure source and a fluid.

A device of this type known in prior art has been disclosed for instance in the Finnish patent application No. 322/69. Such devices of prior art have the drawback that controlling the pressure with the aid of valves so that an upward massaging force is obtained on the legs is cumbersome and requires complicated valve means.

The object of the present invention is to eliminate the drawbacks addressed. The device of the invention is characterized in that the space between the jacket bags and the leg is also connected to the pressure source and can therefore be pressurized, whereby with the aid of the pressure in the intervening space the jacket bags can be simultaneously depleted of pressure and further, after the jacket bags have been pressurized, the intervening space can by the aid of the pressure in the jacket bags be depleted of pressure. With the aid of the invention thus a bipartite jacket structure is obtained around the extremity, in which alternately an upward massaging force is produced with overpressure, or two pressure waves in the same direction. The device is simple to manufacture, and it can be made disposable as regards the jacket to be placed around the extremity. The pressure source, such as an air pump and the requisite control valve, may be constructed as a separate unit.

An advantageous embodiment of the invention is characterized in that the pressures in the jacket bags and in the intervening space are controlled by a multiple-way valve by which the pressure is conducted alternately into the jacket bags and into the intervening space. Therefore, in the device an automatic pacing is produced which may be adjustable for instance by means of a throttling valve.

Another advantageous embodiment of the invention is characterized in that the fluid is air, cooled or heated as needed. In this way, ventilation air is introduced against the skin, either heated or cooled as needed. Such ventilation enables prolonged use of the device. In addition, for the gas introduced against the skin may be used oxygen, and this enables the device to be used also in medical therapy, for instance in treating lower leg lesions.

An advantageous embodiment of the invention is moreover characterized in that the pressure source is a pad-like pump under the leg, operating when the person walks. Thus, the entire device can be made to constitute a shoe, in which case it may be applied on all those who have disorders either in the venous system or in the lymphatic circulation of

their lower extremity. The device is thus automatically operating and no external pressure source is needed.

The invention is described in the following by the aid of an example referring to the drawing attached, wherein

Fig. 1 presents the device, applied on the leg.

Fig. 2 presents the jacket bag components, in open position.

The device consists of consecutive annular, mutually connected elastic jacket bags 2—15 around the leg 1, in which pressures may be produced by the aid of a pressure source P and a fluid, such as air, these pressures producing a massaging effect. The intervening space 16 defined between the jacket bags 2—15 and the leg 1 has also been connected to the pressure source P and can consequently be pressurized, in which case the jacket bags 2—15 may by the aid of the pressure in the intervening space be simultaneously depleted of pressure and further, after the jacket bags have been pressurized, the intervening space 16 may by the aid of the pressure in the jacket bags be depleted of pressure. The pressures in the jacket bags 2—15 and in the intervening space 16 are controlled by a multiple-way valve 17, by which the pressure can be conducted alternately into the jacket bags 2—15 and into the intervening space 16.

The operation of the device is as follows. The pressure P, which may be on the order of 120 mmHg, enters by the tube 18 the jacket bags 2, 3, 4 . . . 15, whereby they are filled in succession and cause an upward massaging motion. When the last jacket bag 15 has been filled, the pressure may discharge through the tube 19, causing a pulse acting on the multiple-way valve 17 and which switches the pressure P over to the tube 20 connected to the intervening space 16. The intervening space 16 is now filled with pressure starting upwards from the toes, the jacket bags 2—15 simultaneously being depleted through the tube 19. Thus, another upward acting massaging force in the same direction is produced. After the pressure in the intervening space 16 has filled the intervening space to the top, the pressure may discharge through the tube 21, causing at the same time a pulse acting on the multiple-way valve 17 which again assumes the other position, whereby the cycles just described are repeated. It is thus understood that with the aid of the device two massaging pressure waves in the same direction are obtained, and the air mass moving in the intervening space 16 against the skin serves as ventilation air, which may be cooled or heated as needed.

On long-distance flights, lasting for instance more than six hours' duration, the passengers' feet tend to swell, with the consequence that their shoes no longer fit and that the feet are tired, aching and frequently feel restless. Disturbance of venous circulation ensues from the lack of muscular pump action, and also from the mechanical stenosis of veins caused by sitting. The device is an excellent in these problems.

It is obvious to a person skilled in the art that the

invention is not confined to the example presented in the foregoing and that it may vary within the scope of the claims stated below. For instance, the device is obviously also usable on an upper
5 extremity.

CLAIMS

1. A device for massaging extremities of the body, such as legs, and for activating fluid flows, said device consisting of consecutive, annular, mutually
10 connected elastic jacket bags (2—15) disposed around the leg (1) and in which by the aid of a pressure source (P) and a fluid pressures can be produced which cause a massaging effect, characterized in that the intervening space (16)
15 defined between the jacket bags (2—15) and the leg has also been connected to the pressure source (P) and can thus be pressurized, the jacket bags (2—15) being with the aid of the pressure in the intervening space (16) simultaneously depletable of pressure

20 and further, after the jacket bags (2—15) have been pressurized, the intervening space (16) being with the aid of the pressure in the jacket bags depletable of pressure.

2. Device according to claim 1, characterized in
25 that the pressures in the jacket bags and in the intervening space (16) are controlled by a multiple-way valve (17) by which the pressure can be alternately conducted into the jacket bags (2—15) and into the intervening space (16).

3. Device according to claim 1 or 2, characterized in that the fluid is air, cooled or heated as needed.

4. Device according to claim 1 or 2, characterized in that the fluid is oxygen.

5. Device according to any one of the preceding
35 claims, characterized in that the pressure source is a pad-like pump under the foot operating when the person walks.

6. A device for massaging extremities of the body substantially as described with reference to the
40 accompanying drawings.